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To Predict or Not Predict: Crossroads for Tactical Intelligence?

A Monograph
by

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This monograph discusses the nature of tactical intelligence prediction in military operations. Such prediction is extremely complex and involves a broad range of factors from traditional military ones such as terrain and doctrine to more non-traditional ones of human behavior and perceptual mechanisms. While the traditional factors are important, the non-traditional ones are no less so and often hinder accurate prediction.

The monograph first examines the U.S. Army's doctrinal requirement for tactical intelligence prediction, both past and present. Next, it discusses and clarifies the concepts of "capabilities," "enemy intent," and "prediction." Intelligence Preparation of the Battlefield (IPB) is then examined as a vehicle for intelligence prediction. The monograph then moves on to describe the behavioral aspects of prediction in terms of individual and organizational factors which inhibit objective analysis. Historical examples are provided.
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ABSTRACT

TO PREDICT OR NOT PREDICT: CROSSROADS FOR TACTICAL INTELLIGENCE? by MAJ Linda L. Linden, USA, 45 pages.

This monograph discusses the nature of tactical intelligence prediction in military operations. Such prediction is extremely complex and involves a broad range of factors from traditional military ones such as terrain and doctrine to more non-traditional ones of human behavior and perceptual mechanisms. While the traditional factors are important, the non-traditional ones are no less so and often hinder accurate prediction.

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Finally, an expanded version of IPB is offered as an analytical model offering a more comprehensive and objective approach to tactical intelligence prediction. The monograph conclusion is that U.S. Army doctrine does require tactical intelligence to be predictive in nature, that IPB is inadequate as the current predictive method, and that the suggested analytical model will improve our ability to predict enemy courses of action.

Table of Contents

INTRODUCTION

> . . . When I bring the sword upon a land, if the people of the land take a man of their coasts, and set him for their watchman:
>
> If when he seeth the sword come upon the land, he blow the trumpet and warn the people;
>
> Then whosoever heareth the sound of the trumpet, and taketh not warning; if the sword come, and take him away, his blood shall be upon his own head.
>
> He heard the sound of the trumpet, and took not warning; his blood shall be upon him. But he that taketh warning shall deliver his soul.
>
> But if the watchman see the sword come, and blow not the trumpet, and the people be not warned; if the sword come, and take *any* person from among them. . . his blood will I require at the watchman's hand.
>
> Ezekiel 33:2-6

These words from the Prophet Ezekiel describe the relationship of intelligence to military decision making. The intelligence officer sounds the trumpet in the form of the intelligence assessment, the commander may take heed of it or not in considering courses of action, and the military outcome may well hinge not only upon the reception of the warning, but also upon its timeliness and accuracy. Today, as in Ezekiel's time, we place much trust in that solitary watchman's vision and judgment. This paper is written both for the watchman and those who depend upon him. It is about how to see the sword and how to sound the trumpet.

"The purpose of tactical intelligence operations is to obtain and provide decision makers reliable information about the enemy,

weather, and terrain as quickly and completely as possible."[1] One of the primary goals of tactical intelligence is to reduce battlefield uncertainty.[2] In theory, if we could reliably and accurately predict specific enemy actions in a given situation, we could approach some state of battlefield certainty. In practice, of course, this is seldom if ever possible. Even the most generalized predictions are the result of an exceedingly complex process involving enemy intentions, relative capabilities, combatant interaction, and battlefield friction, as well as the predictor's analytical techniques and personal and experiential biases. The U.S. Army's predictive intelligence process focuses on the first two of these factors, enemy capabilities and intentions in order to satisfy the informational demands of AirLand Battle (ALB). In assessing our ability to do that, I will examine past and present doctrinal statements about intelligence requirements, Intelligence Preparation of the Battlefield (IPB) as the current intelligence analytical model, the nature of the predictive process, and historical examples of predictive failures and successes. In the conclusion I will propose ways to improve the tactical predictive process.

A few words are in order concerning the scope and assumptions of this paper. My focus is the tactical level of war. Discussions of military organizations refer primarily to U.S. army corps down to battalions, the lowest level at which we find formal staff functions. I have assumed conventional war, mid- to high-

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[1] FM 34-1; Intelligence and Electronic Warfare Operations; Washington, D.C.: Headquarters, Department of the Army, July 1987; p. 2-11.
[2] FM 34-1, p. 2-5.

intensity, against a Soviet-style enemy, although some of the conclusions may have wider applicability. I have further assumed IPB to be deficient for reliable prediction, based on recent work by U.S. Army writers.[3] Finally, my references to intelligence analysts are not limited to those holding MOS 96B, but include anyone who assesses enemy intentions.

DOCTRINAL INTELLIGENCE REQUIREMENTS

In the United States Army, the period after WWI saw the role of intelligence expanding and the field becoming more specialized. This was due to the battlefield's growing size and complexity, and with the consequent impossibility of the commander personally dealing with all incoming data. From just after World War I to just after World War II a number of books were written about the proper role of intelligence. Most of these were written by former intelligence officers and were concerned with the collection and reporting of information, whether one should report mere facts or draw conclusions about enemy intentions, who should do this, and whether or not prediction was either desirable or feasible.

In 1924, LTC Walter C. Sweeney wrote insightfully about the "new and important" field of Military Intelligence.[4] He made a sharp distinction between what he called the "evaluative function" of intelligence and the drawing of tactical conclusions from it. The

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[3] Especially Campbell, McKinney, Quirk, and Thaden. See bibliography.
[4] Sweeney, LTC Walter C.; Military Intelligence: A New Weapon in War; New York, NY: Frederick A. Stokes Company, 1924; p. viii.

former was an Intelligence Service function and had to do with turning raw data into a comprehensive picture of the current enemy situation. Tactical conclusions, which would enable one to determine the enemy's probable plans and intentions, were strictly a General Staff function, ". . . one which [the] G-2 as a trained General Staff officer is charged with performing. His tactical conclusions are not Intelligence but are deductions made from a study of intelligence for the information and use of the commander."[5] Of significance, the G-2's credentials for drawing such tactical conclusions were based on his thorough familiarity "with his own as well as the enemy's forces, their methods of combat, general plans and psychology."[6]

A dozen years later, in 1936, COL Edwin Schwien, an instructor at the U.S. Army Command and General Staff School, flatly declared it impossible to positively identify the enemy's intentions, and even if it were possible, the fog of war made the carrying out of those intentions extremely tenuous.[7] He expressed particular contempt for such phrases as "probable enemy intentions" and "most probable enemy action."[8] In place of such prediction, he proposed that the G-2 present the commander with a list of enemy capabilities, eliminating only those courses of action which were physically impossible or which would have absolutely no effect on the friendly course of

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[5] Ibid., p. 167.
[6] Ibid.
[7] Schwien, COL Edwin E.; Combat Intelligence: Its Acquisition and Transmission; Washington, D.C.: The Infantry Journal, Inc., 1936; pp. 20-22.
[8] Ibid., p. vi.

action.[9] In response to the charge that such a procedure might result in an unmanageable number of enemy courses of action which to consider, Schwien suggested classifying them into general categories according to their overall effect on the friendly plan.[10]

Schwien's influence was apparently quite strong, for we find his concepts echoing down the halls of intelligence and military decision making literature for the next decade or more. In 1942, the Naval War College handbook on military decision making emphasized that the commander is properly not interested in what the enemy intends to do, but rather in everything that the enemy can do.[11] After World War II, two more instructors at the Army's Command and General Staff College, LTC Robert Glass and LTC Phillip Davidson, refined Schwien's concepts. Continuing to reject the value of identifying enemy intentions, they defined enemy capabilities as those courses of action "which the enemy *can physically perform* and which will interfere with or favor the accomplishment of our mission."[12] (Emphasis mine.) The clear implication here was that there was some sort of physical absolute against which one could measure, define, and provide an exhaustive list of enemy capabilities.

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[9] Ibid., p. 22.
[10] Ibid., p. 23.
[11] Sound Military Decision; textbook used by the Naval War College; Newport, RI: U.S. Naval War College, first published 1936, reprinted 1942; p. 140.
[12] Glass, LTC Robert R. and LTC Phillip B. Davidson; Intelligence is for Commanders; Harrisburg, PA: Military Service Publishing Company, 1948; p. 49.

The Army's official guidance on predictive intelligence over the years is reflected in the evolution of FM 101-5 and its predecessors. This manual specifies the role of intelligence in military decision making. Evolutionary differences have focused on whether or not the G-2 should outline probable enemy courses of action (COA), and if so, how best to derive them -- by analyzing enemy capabilities or enemy intentions. The 1928 and 1932 versions of FM 101-5 defined the primary function of the Military Intelligence Section (G-2) as "keep[ing] the commander and all others informed regarding the enemy's situation and probable intentions."[13] The 1940 version modified the G-2's primary function "to keep the commander and all others concerned informed regarding the enemy's situation and *capabilities*." (Emphasis mine.) It described the specific duties of the Military Intelligence Section (G-2) as "evaluation and interpretation of information obtained to determine its probable accuracy, significance, and importance, and based thereon the estimation of the enemy's capabilities."[14] If exceptionally reliable information were available, the G-2 was permitted to express "the relative probability of adoption of [enemy] lines of action when such a statement can be justified."[15] The 1950 and 1954 versions kept the basic line of the 1940 version, adding emphasis on assessment of enemy courses of action which could impact on friendly actions, and also emphasizing the G-2's responsibility for

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[13] FM 101-5, 1928 and 1932, p. 11 in both editions.
[14] FM 101-5, 1940, p. 11.
[15] Ibid., pp. 91 and 126.

weather and terrain data. Also, beginning in 1950, evaluation of information for accuracy was omitted as one of the G-2's specific duties.

1960 brought a change in emphasis. That year's version of FM 101-5 specifically charged the G-2 with the responsibility of "estimating enemy capabilities and vulnerabilities, including the course of action the enemy is most likely to adopt."[16] This same focus was maintained in the 1968 and 1972 versions of the manual. The current version (1984) charges the G-2 with listing two or three enemy courses of action, in order of probability of adoption. These courses of action are selected from the range of all those which the enemy is capable of conducting, combined with a judgment

> . . . from the enemy point of view to determine if the adoption of the capability is advantageous to the enemy. The judgments need not be made if the conclusion is obvious or if there is no evidence that the enemy will adopt the capability. The exception is the capability that will make the accomplishment of the friendly mission highly doubtful or impossible. This exception is to focus attention on dangerous threats.[17]

Two significant observations emerge from a study of this evolution. First, we have little confidence in our ability to assess enemy intentions, and thus we rely heavily on empirically observable facts to determine capabilities. Second, the Army's formal decision making process requires the G-2 to make a prediction of enemy actions by assessing the relative probability of adoption of a

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[16] FM 101-5, 1960, p. 23.
[17] FM 101-5, May 1984; p. E-17.

small number of enemy COA. The primary criteria for choosing these COA have changed over the years from consideration of only those which have significant impact on friendly COA to consideration of those which would be most advantageous from the enemy point of view.

As important as formal decision making processes are, however, they are but a reflection of the U.S. Army's warfighting doctrine. Thus, let us seek the foundation for intelligence prediction by examining our current basic and implementing doctrine. The Army's keystone operational doctrine is outlined in FM 100-5. In laying the foundations of AirLand Battle (ALB) doctrine, the manual discusses the role of intelligence as a basis for timely tactical decisions and the requirement for the tactician to anticipate the enemy. However, it refrains from establishing a clear requirement for specific intelligence prediction, emphasizing the descriptive rather than predictive role of intelligence. It describes the intelligence estimate as concentrating "on physical phenomena -- terrain and weather -- which cannot be significantly modified."[18] Occasionally, statements are made which seem to imply the need for a predictive capability, but the lack of an overt statement to that effect indicates that prediction is not the primary role of intelligence in ALB.[19]

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[18] FM 100-5 Operations; Washington, D.C.: Headquarters, Department of the Army, May 1986; p. 34.

[19] For example, on p. 33 the tactician is enjoined to "anticipate the enemy." On p. 34, the staff planning process "demands the acquisition of information about the enemy that the opposing commander tries to withhold and misrepresent." On p. 46, "The intelligence officer (G2 or S2) must inform the

In examining maneuver force implementing doctrine in the 71-series field manuals, however, we see a different interpretation of the intelligence function regarding the requirement for prediction. At corps level, the operational planning process is characterized as "predictive" in that each friendly COA is analyzed "by describing the enemy probable response and then subsequently the friendly option to preclude the success of the enemy response."[20] The IPB process (specifically situation templating) is the method used for determining the array of enemy COAs:

> Situation templates indicate enemy feasible courses of action which are analyzed to produce those COAs that are deemed to be the probable courses of action. Enemy probable courses of action are those feasible COAs against which the planner arrays friendly forces in the development of friendly COAs during the estimate process.[21]

Thus, corps operations clearly require specific prediction of enemy courses of action. The basis for determining these is the IPB process.

The requirement for prediction is also clearly stated at levels below corps, though the specificity varies. At division, IPB is described as the process for intelligence analysis and prediction,[22] and the G-2 is charged with providing "early accurate intelligence

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commander and all others concerned regarding the enemy situation *and capabilities*, terrain and weather." (Emphasis mine.) Finally, on p. 120, when planning attacks, the enemy's "probable intentions" must be considered.

[20] FM 100-15 Corps Operations; Washington, D.C.: Headquarters, Department of the Army, September 1989; p. 4-22 and Figure 4-16 on p. 4-23.

[21] Ibid., p. 4-12. Recall that situation templates include information on current enemy disposition, and recent and significant activity. It is the analysis of this, combined with enemy doctrine and local terrain, which the IPB process uses to derive probable courses of action.

[22] FM 71-100 Division Operations; Washington, D.C.: Headquarters, Department of the Army, November 1988; p. 5-6.

assessments and *best guesses* that will expedite decision cycles." (Emphasis mine.)[23] At brigade level, the S2 must provide the commander with "anticipated enemy courses of action" in the offense, and in the defense he must "predict and confirm enemy intentions."[24] At battalion task force level, the S-2's job is to "sift and analyze volumes of intelligence information and provide the commander his assessment of a most likely course of action."[25] As at other echelons, the procedure for accomplishing this is the IPB process, specifically relating the "threat evaluation to the terrain and weather to predict how the enemy will plan his maneuver in the area of operations."[26] Thus, although AirLand Battle doctrine does not require intelligence to be specifically predictive in nature, implementing doctrine at corps level and below does.

INTELLIGENCE PREPARATION OF THE BATTLEFIELD

As indicated above, IPB is the Army's approved method for predicting enemy courses of action in a given tactical situation, and intelligence doctrine reinforces this concept. FM 34-130 states that "the graphic intelligence bases developed and maintained throughout the IPB process . . . provide a means for projecting significant battlefield events and enemy activities and for predicting enemy

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[23] Ibid., p. 5-12.
[24] FM 71-3 Armored and Mechanized Infantry Brigade; Washington, D.C.: Headquarters, Department of the Army, May 1988; pp. 3-4 and 4-11.
[25] FM 71-2 The Tank and Mechanized Infantry Battalion Task Force; Washington, D.C.: Headquarters, Department of the Army, September 1988; p. 2-29.
[26] Ibid., p. 2-27.

intentions."[27] Situation and target information "is used to predict enemy activity and to produce event-related forecasts of battlefield operations."[28] Finally, in an explicit statement of the relationship between IPB and intelligence prediction: "By recognizing what the enemy can do, and by comparing it with what the enemy is doing, we can predict what the enemy probably will do next."[29]

Having shown that our tactical doctrine does require predictive intelligence, and that the IPB process is the doctrinal method by which we derive prediction, we must ask the obvious question: Is IPB a reliable predictor of enemy activity? A number of recent articles have addressed this and have arrived at a negative answer. The general approach of the articles has been to describe the limitations of IPB and then suggest that, since IPB cannot be used for intelligence prediction, intelligence officers ought not to predict, but only describe the range of enemy capabilities. Although I strongly disagree with this suggestion, the writers' analyses of IPB's limitations are worth summarizing.

Of the recent writings, MAJ Russell Thaden's study is the most comprehensive, using current doctrine and three historical case studies as documentation.[30] After examining the intelligence pictures in the case studies (Ardennes 1944, Russian 1944 Summer Offensive,

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[27] FM 34-130 Intelligence Preparation of the Battlefield; Washington, D.C.: Headquarters, Department of the Army, May 1989; p. 2-2.
[28] Ibid., p. 4-1.
[29] Ibid., p. 4-59.
[30] Thaden, MAJ Russell H.; Intelligence Preparation of the Battlefield and Predictive Intelligence; Ft. Leavenworth, KS: School of Advanced Military Studies, 3 DEC 1986.

and Manchurian Campaign 1945), Thaden found that in each case the defenders had the equivalent of a good IPB, yet they failed to adequately predict the enemy course of action and were the victims of surprise. He concluded that IPB has five shortcomings which prevent it from being a reliable vehicle for prediction of enemy activity. First, it weights terrain too heavily as a factor in assigning relative probabilities to enemy courses of action. Second, it relies on an understanding of enemy tactical doctrine as the primary means for predicting enemy courses of action. This ignores such other important -- and often overriding -- factors as the enemy commander's personality and the enemy's understanding and use of surprise. Third, it tends to discount battlefield dynamics -- the interplay between friendly and enemy actions. Fourth, it tends to promote a false sense of confidence, in that we tend to see new enemy information only as confirming those few enemy COAs we have chosen based on terrain and doctrine. Finally, Thaden takes issue with the whole concept of assigning probabilities to enemy courses of action. Such a procedure, he argues, means that we do not plan for unlikely enemy COAs and thus are at serious risk if for some reason the enemy adopts one of these.

In summary, although the IPB process provides a good structure for analyzing certain fixed characteristics of the enemy and the battlefield, Thaden concludes that its underlying assumptions and limited scope make it unsuitable for reliable intelligence prediction. As our current tactical doctrine clearly requires some degree of predictive intelligence, and as IPB seems unsatisfactory in

the matter, our problem is to identify the full scope of factors critical to prediction, then incorporate them into an analytical methodology. First, though, let us clarify the relationship of the terms "prediction", "capabilities", and "intent".

"PREDICTIVE INTELLIGENCE"

As discussed earlier, The U.S. Army has for many years made a clear distinction between estimation of enemy capabilities and estimation of enemy intent, and it has debated the merits of basing predictions on one or the other. Our current doctrine is heavily weighted in favor of estimating capabilities. Enemy intent (though we tend to shy away from calling it such) is derived by assigning relative probabilities to a list of capabilities. This emphasis on capabilities stems from the widespread belief that they are easier (more empirically observable) and less risky to assess than enemy intentions in some sort of absolute state.

In fact, although directly estimating intentions may be a complex process, estimating capabilities is not significantly less so.[31] For one thing, the enemy may not himself know his capability to carry out an intention until just before the event; yet his intention may be quite clear. Another factor to consider is that capabilities frequently change, especially in a dynamic tactical situation, whereas intent often remains fixed for the duration of the operation. Thus,

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[31] Kam, Ephraim; Surprise Attack: The Victim's Perspective; Cambridge, MA: Harvard University Press, 1988. This and subsequent observations on the question of capabilities vs. intentions come from this book. Although Kam writes from a strategic perspective, many of his points have direct applicability to the tactical level.

there is a great danger in relying too long on a capabilities estimate; without continual reassessment, incremental mistakes can become catastrophic. Finally, there is the tendency of intelligence analysts to state enemy capabilities in unopposed terms. For example: "The enemy has the capability of air assaulting two battalions into the corps rear within 12-24 hours." This is an absolute assessment, not one based on our ability to disrupt such action. Due to unfamiliarity with friendly capabilities, most intelligence analysts are poorly prepared to make true net assessments of enemy capabilities, thus their estimates become *de facto* "worst case."

For the reasons cited above, estimates of capabilities are not nearly as quantifiable and objective as they seem, yet their seeming objectivity often leads analysts to place far more confidence in them than is warranted. Enemy ignorance of his own "capabilities," rapidly changing situations, and the relative nature of capabilities all combine to make their assessment far more complex and subtle than is popularly thought. Oversimplification of this process, particularly if it is carried out without appropriate analysis of enemy intent, may result in significantly skewed estimates.

Before leaving the discussion of intent versus capabilities, let me point out that all predictive intelligence must somehow estimate the enemy's intent. The question is, how do you do that? Sometimes, even as low as division level, you will have direct access to the enemy's intentions, and there is nothing wrong with using that as the basis for an estimate. Usually, though, tactical commanders will not have such direct access, and the analyst must derive intent

indirectly. One way to do that is the U.S. Army's method of establishing baseline capabilities, assembling them into possible courses of action, then backing into intent by assigning relative probabilities to the courses of action. The thing to remember is that establishing baseline capabilities is not necessarily a straightforward process.

THE NATURE OF INTELLIGENCE PREDICTION

Though the primary IPB factors of terrain, doctrine, and tactical situation are an important part of intelligence prediction, they are often outweighed by a sizeable body of behavioral factors. The ones which most affect tactical intelligence prediction are: biases, enemy view of options, distraction, intelligence collection, deception, time, the human factor, and organization.[32] Each is described below.

THE BIAS FACTOR: General Comments. A great deal of research has been done in the field of biases. One of the foremost authorities on the subject, particularly as it applies to intelligence

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[32] Cubbage, T.L. II; "The German Misapprehensions Regarding Overlord: Failure in the Estimative Process;" in Strategic and Operational Deception in the Second World War; Michael I. Handel, ed. (New York: Frank Cass & Co., LTD, 1987); pp. 114-174. Cubbage selected and summarized ten basic factors: human, bias, expectation, options, plausible interpretation, distraction, intelligence collection, deception, time, and organization. Since some of his factors are virtual restatements of each other, I have limited the discussion of those to essential points. Also, his work is liberally footnoted, but where possible I have gone to the original source and have so noted those instances. As with most of the information on intelligence prediction, the experts' focus is on strategic and operational levels. I have extracted that which is pertinent to the tactical level.

analysis, is Richards Heurer, to whom I will refer extensively in the following paragraphs. Heurer points out that humans, unable to deal with the raw complexities of the world, design "simplifying strategies" in order to efficiently process information and make decisions.[33] These strategies, which are called biases, are in fact a kind of model, and like all models they reflect reality only imperfectly. Biases form identifiable patterns in their departures from reality,and they are statistically predictable.

The bias factor is the single greatest influence on the problem of perception of predictive intelligence analysis. It manifests itself at all levels, from the inner workings of an individual analyst's mind through the decision making processes of entire organizations. An understanding of biases is crucial to understanding not only the predictive process as a whole, but also to understanding the interplay of the other factors affecting prediction. There are four main categories of biases: cultural, motivational, cognitive, and perceptual.[34]

Motivational and cultural biases vary greatly from army to army and organization to organization. One cannot generalize their impact, particularly at the tactical level, thus we will omit further discussion of them, with one exception. We sometimes manifest cultural bias through projection, in which we attribute our own belief

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[33] Heurer, Richards J., Jr.; "Cognitive Factors in Deception and Counterdeception;" in Strategic Military Deception; Donald C. Daniel and Katherine L. Herbig, ed. (New York: Pergamon Press, 1982), p. 32. Hereafter referred to as Heurer, "Cognitive".

[34] Ibid.

systems and values to the enemy. In addition to the obvious possibilities for error, cultural bias also tends to make us believe that the enemy's methods are somewhat inferior to ours and that we have a superior grasp both of his doctrine and tactics, and of the situation in general. Thus, there is the possibility not only of errors but of overconfidence in those errors.

PERCEPTUAL BIASES. Perceptual biases have to do with the way individuals perceive phenomena; they predispose us toward a certain interpretation of incoming data and thus may limit accurate judgment. Contrary to a widely held belief, perception is not a passive process in which we merely record observations, but an active one by which we construct beliefs about reality.[35] So vital is this process to our understanding of the world, that, once we have formed an initial perception, we cling to it with extraordinary tenacity. Heurer cites a large body of research and provides illustrations to prove this fact, then goes on to describe its consequents.[36] One of these is that we tend to perceive what we expect to perceive. That is, given that each of us has a finite set of internal perceptual models, we quickly select one as the governing model for a set of incoming stimuli, and we may then distort data to fit the expectations of that model. This enables us to quickly organize the data that is initially available to our senses. Having selected a model and "confirmed" that the one selected is appropriate, we form

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[35] Ibid., pp. 33-34.
[36] Ibid., pp. 33-39.

coherent images and a hypothesis of the situation. As new information comes in, we assimilate it to fit our existing images. That is, we see new information as confirming the perception we have formed, often distorting or ignoring information which doesn't. Studies have shown that, even when we know that our initial perception is incorrect and we know exactly what the correct perception ought to be, we are able to change only with great difficulty. The same principles apply when we are initially confronted with ambiguous information; apparently the human need for mental order is so strong that we will form hypotheses about even formless data for which we have no appropriate mental model. The impact of all this is that the amount and quality of data required for us to discard an initial perception are incredibly greater than were required to form it. In like manner, the longer a situation remains ambiguous, the more persuasive the clarifying data must be for us to accurately perceive it.[37]

Psychological investment is another pitfall with basis in perceptual bias.[38] This occurs when we move from an internal hypothesis about some event to an external, formal, reasoned opinion about it. The more work we have put into arriving at the opinion and the more widely and formally it has been disseminated, the greater our psychological investment in it. We continue to seek facts to support it, and it gets more and more difficult to change the opinion.

Summarizing the biases of perceptual biases:

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[37] Ibid., pp. 34-42.
[38] Cubbage, p. 137.

> Once formed and adapted, initial beliefs will structure and distort the processes through which subsequent evidence is interpreted. New evidence will appear reliable if it is consistent with one's initial beliefs; contrary evidence is dismissed as unreliable, erroneous, or unrepresentative. In general people are more apt to err on the side of resisting a change in their beliefs than to make the opposite error of too quickly altering them; and people are too quick to reject discrepant information.[39]

The task of the intelligence analyst now seems even more formidable: his very job is to provide continual shifts in the perception of data on hand and fresh interpretations of new data. As we have seen above, such a task is counter to the very nature of human perception. In fact, "this is a recipe for inaccurate perception."[40]

COGNITIVE BIASES. Whereas perceptual biases have to do with how we make incoming data presentable to our minds, cognitive biases have to do with how we reason and apply logic to link that perceived data. In problems of intelligence prediction, cognitive biases affect how we estimate probabilities, evaluate evidence, and determine causal relationships.[41] The main cognitive biases which affect our estimation of probabilities are availability, anchoring, and overconfidence.

Availability is a method in which we try to imagine or recall situations similar to the problem situation; based upon the ease with

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[39] Kam, p. 89.
[40] Heurer, "Cognitive"; p. 40.
[41] Ibid., p. 44.

which we are able to do that, we assign some degree of probability to the situation under consideration. This method often works fine for us, since it is easier to recall or imagine situations which frequently occur than those which rarely do. The problem is that sometimes situations are readily available to us for reasons other than frequency of occurrence -- say, because our job is to anticipate or watch for them. Thus, when asked to estimate the probability of occurrence of a situation similar to the type we are watching for, there is a tendency to overestimate its probability because of the frequency with which we have imagined it or the intensity of study we have devoted to finding historical examples of its occurrence.[42] The opposite effect also occurs, in which we rate an event as low probability because our experience has not led us to plan for similar events or to note their historical occurrence. Though humans use this bias intuitively for estimating probabilities in everyday events, its experientially limited scope would seem to make it a poor choice for estimating the relative probabilities of enemy courses of action.

An anchoring bias occurs when we use one situation as a starting point, then adjust all changes from there. The process goes something like this: Situation X is determined to have a 20% probability of occurrence. New information comes in which indicates that conditions have changed. To estimate the new probability of occurrence of Situation X, we take 20% as the "base" probability and modify it up or down to fit the new conditions. The problem with this anchoring process is that we tend to restrict the magnitude of our

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[42] Ibid., pp. 44-50.

revisions so as not to stray too far from the base situation. Tests have shown that people consistently bind their estimates to the anchor situation, even when they know that the correct estimate is significantly higher or lower than what they have stated.[43] When an intelligence analyst uses this method for estimating probabilities, the result may be that a revised prediction more accurately reflects tne previous prediction than the new conditions.

The last cognitive bias affecting probability estimation is overconfidence. People generally consider the accuracy of their knowledge to be significantly greater than it actually is. In fact, tests conducted on intelligence analysts found that this bias increased as the difficulty of the question increased. That is, the gap between what the analysts thought the accuracy of their answer was, and what it really was, got larger. Of note, high intellect or extreme expertise in a given area do not lessen this bias. However, frequent, immediate, and specific feedback does.[44]

There are also several cognitive biases which affect our evaluation of evidence. One of these is an oversensitivity to consistency. Briefly, this involves a belief that small amounts of consistent data are more reliable than larger amounts of inconsistent data. What this means for military decision making is that there is a tendency to make high-confidence predictions based on small amounts of relatively consistent -- but statistically insignificant -- data. Additionally, a commander may have a tendency to place

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[43] Ibid., p. 46.
[44] Ibid., pp. 44-48.

greater faith in intelligence estimates which have the unanimous approval of his staff than in those which generate dissent.[45] Another bias that hinders our ability to evaluate evidence is the failure to take missing but relevant data fully into account. Even experts who are able to correctly describe what kinds of critical data are missing in a given situation and the importance of that data to a correct appraisal, generally will go ahead and make assessments on the basis of the data available and downplay the importance of the missing data. Finally, there is the problem of persistence of impressions based on discredited evidence. Once we have postulated a cause for some existing evidence, we continue to believe in the existence of that cause even after the evidence we were seeking to explain is authoritatively proved false.[46] We will even continue to seek additional evidence to prove the cause. This bias is similar to the perceptual bias of the primacy of the initial perception, and it is as strongly held. Thus, if Reports A and B indicate the enemy will pursue COA #2, and then the reports are proved to be completely false, there is a tendency to persist in the belief that the enemy is planning COA #2.

The last set of cognitive biases affect our perception of causality. The first is a bias toward causal explanations. That is, human beings have a strong tendency to believe that events have specifically identifiable causes, and a like tendency to disbelieve in a random or chance generation of events. The second is termed an

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[45] Ibid., pp. 50-51.
[46] Ibid., pp. 53-54.

attributional bias, which describes our tendency to attribute behavior to either external or internal causes. Specifically, we tend to see our own actions as determined by external causes; that is, our own behavior is situationally dependent. In contrast, we tend to attribute the actions of others to internal causes; that is, their behavior is personality dependent. Though no study has been done to validate it, it seems reasonable to apply this attributional bias to a military context of friendly vs. enemy.[47] As an example, the American tendency is to attribute Soviet military actions to internal causes (dogmatic doctrine) and to attribute our own to the military situation (METT-T).

To sum up, cognitive biases affect three critical aspects of intelligence prediction: *estimation of probabilities, evaluation of* evidence, and causal estimates. Perceptual biases hinder the creative and imaginative aspects of intelligence prediction by tying the analyst to his expectations and to the order in which data is received. These perceptual and cognitive biases act upon each other and upon all the rest of the factors bearing on intelligence prediction.

THE OPTIONS FACTOR. An enemy commander will choose a course of action from those he believes are open to him. To state it another way, the only possible enemy courses of action are those which the enemy believes are possible. That is a simple and obvious fact, yet its subtler and critical implications are often overlooked. To understand his view of what is possible, we must know his method

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[47] Ibid., pp. 55-59.

for making decisions, his view of the status of his own forces, and his intelligence picture. One of the key elements of his decision making is his assessment of risk. For Soviet-style forces, the key to finding a set of baseline possibilities for courses of action is the correlation of forces methodology used by Soviet staffs. Analysis of a full set of correlation of forces statistics for any given tactical situation will also yield a rough concept of what the Soviet commander sees as risk.

THE DISTRACTION FACTOR. Distractions are another barrier to effective intelligence prediction, because they play on our perceptive and cognitive processes. There are four types which bear on tactical intelligence: "noise", fear, hope, and alert fatigue.[48] "Noise" is used in the sense of signal noise, that is, competing signals (some clear, some not) which prevent the essential signal from being heard. Of four types of intelligence -- true and false, relevant and irrelevant -- we are really only interested in the combination true-relevant, yet the three remaining combinations continually distract us. The distraction of fear can occur when a unit has reached the limits of both its operational and analytical capabilities, believing itself unable to deal with any additional threats. Under such circumstances, faced with the unpleasant possibility of an enemy COA which they had not previously considered and planned for, there is a tendency to ignore the new data completely or consider the new COA highly improbable. The distraction of hope is the other side of the same coin. Once one or

[48] Cubbage, pp. 148-152, also includes the distractions of work and of self-righteousness, but these appear to be significant only at levels above tactical.

two enemy COA have been determined to be the most probable, and plans have been made to deal with these, all hope is placed in their execution, and they are seen as being the most "reasonable" for the enemy to pursue, when in fact they may not be. However, we have transferred our hope that they will occur -- since we have prepared for them -- into a probability that they will. Once again, the result is to ignore or distort information to the contrary. Finally, there is the distraction of fatigue, a sort of "cry wolf" syndrome. While the phenomenon is better known at the strategic level, it applies also at the tactical. It occurs when the enemy has repeatedly indicated his preparations for imminent execution of a particular COA, but it never materializes. The natural tendency is to place less and less reliance on such indications, perhaps even to discount them entirely. Eventually, although all the indications are present for execution, we fail to predict the COA prior to its actual execution.

THE COLLECTION FACTOR. Intelligence prediction is the product of the information available to the analyst. If the information is skewed, particularly at the macro level, accurate prediction is doomed. The nature of intelligence collection procedures is such that we get the information that is most easily collectable, not necessarily that which we most need.[49] If large amounts of information are available, and if through the filter of perceptual bias we find most of that information relevant to our hypotheses about the enemy, we are less likely to identify critical gaps. Even if we do

[49] Kam, p. 55.

identify some gaps and increase the collection effort, the results most often are more "noise", the possibility of information overload, and greater confidence in what is probably not a more precise prediction.[50]

THE DECEPTION FACTOR. A good deal has been written about the deception factor in intelligence prediction, so I will only make a couple of observations. First, the deception principle of striving to reinforce an enemy's preconceived notions exploits human tendencies for perceptual and cognitive biases, as discussed above. Second, the period when we are most vulnerable to a massive deception effort would appear to be in the early stages of the predictive process. The limited information available to us at this stage wields far more power in the formulation of predictive estimates than the larger amounts available later. If the early information is carefully choreographed to paint a certain picture, we are far more likely to "buy" it then than we are later when it may appear inconsistent (and therefore irrelevant or false) or when we may distort it to support the prediction we have already established.

THE TIME FACTOR. As one might expect, time is a critical factor. Many of its individual effects on prediction have been touched on above, but their aggregate effect on the processes of information acquisition, analysis, and acceptance is so critical that it assumes a

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[50] Ibid.

quality all its own.[51] The result of the cumulative effects is best summed up:

> If we consider the circumstances under which accurate perception is most difficult, we find these are exactly the circumstances under which intelligence analysis is generally conducted - dealing with highly ambiguous situations on the basis of information that is processed incrementally under pressure for early judgment.[52]

The pressure for early judgment serves to reinforce the already substantial importance we attach to early information. This pressure also tends to force the analyst to scrutinize even the tiniest developments in a situation, which generally results in an inability to see the overall significance of small changes over time.

THE HUMAN FACTOR. The human factor involves the individual personalities and attitudes of decision makers and analysts. It includes commanders' open-mindedness and openness to criticism; their attitudes towards intelligence in general and their G-2/S-2 in particular; their styles of decision making; the experience levels and backgrounds of intelligence analysts and of the G-2/S-2; and the interaction among the intelligence officer, the rest of the staff, and the commander.

THE ORGANIZATIONAL FACTOR. A tactical unit tends to be a tightly knit organization, whose "personality" reflects that of its

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[51] Cubbage, pp. 156-159.
[52] Heurer, "Cognitive"; p. 40.

commander. It is difficult to overestimate the role of the commander in intelligence prediction. Ideally, there is a "chemistry" between the commander and his G-2/S-2, in which each understands the other's job and resources, each feels free to be open with the other, and each trusts the other and recognizes both blind spots and strengths.[53] On the one hand, since the intelligence estimate is only one of many factors which go into a commander's decision, the commander may consciously choose to disregard it based on other overriding factors, but that decision ought not to be based on oversight, mistrust, or misunderstanding.[54] On the other hand, "[Army commanders of today] find it hard to accept a situation in which nobody can foretell the future for them. Many of them hope, or delude themselves, that the intelligence system serving them can fulfill this purpose."[55] The problem for both the commander and the G-2/S-2 is to arrive at a sensible position between two extremes: blind faith in the intelligence estimate and total mistrust of it.[56]

Another aspect of the organizational impact on intelligence prediction, particularly in military units, is the tendency to discount the views of low-ranking individuals, inexperienced analysts, or outsiders (those who have not been closely following the situation). This is unfortunate, since it may be these very people who have the

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[53] Gazit, Shlomo; "Intelligence Estimates and the Decision-Maker." in Leaders and Intelligence; Michael I. Handel, ed. (Totowa, NJ: Frank Cass & Co., Ltd., 1989).
[54] Ibid.
[55] Ibid., p. 261.
[56] Ibid.

most unbiased views and freshest judgments.[57] Finally, "groupthink" may seriously hinder accurate intelligence prediction. Very cohesive groups tend to seek concurrence more vigorously than less cohesive ones. "The more amiability and esprit de corps among members of a policy-making in-group, the greater is the danger that independent critical thinking will be replaced by groupthink."[58] Finally, military organizations tend to place high value on consistency; the fact that this is often due to very good operational reasons does not negate its unfortunate effect of stifling major intelligence reassessments and iconoclastic interpretations of information.

FACTORS INFLUENCING INTELLIGENCE PREDICTION: SUMMARY

To summarize the data presented so far, we use IPB to make our initial estimate of possible enemy courses of action; the nature of IPB is such that this estimate is based primarily on the relatively fixed and available data on terrain, weather, and enemy doctrine. Various perceptual and cognitive biases cause this initial data to wield great weight in subsequent analyses of probable courses of action. These same biases also cause us to see new data as supporting our initial estimate. Relying heavily on the intuitive methods of availability and anchoring, we assign priorities to enemy courses of action. The intelligence estimate is then essentially complete, and we place some degree of confidence (usually too much) in its accuracy.

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[57] Kam, pp. 160-162.

[58] Irving Janis, quoted in Kam, p. 163.

Since we believe it to be essentially correct, our desire to re-evaluate it diminishes, and any subsequent changes are generally confined to adjustments to the original estimate -- the use of anchoring again. At this point, intelligence collection procedures, far from enhancing accurate prediction, tend to hamper them, for we task them to provide us information focused on what we have established as probable enemy courses of action. The new data is more likely to confirm our estimate than not, due to our natural perceptual biases and to what is by now a psychological investment in the estimate. This is reinforced by organizational and individual emphases on consistency. Finally, it becomes almost impossible to make drastic intelligence reassessments. Distractions of hope and fear combine with psychological investment, with the dedication of assets to providing supporting evidence, and with the steady erosion of time available to make and implement friendly decisions.

In short, during the course of one tactical planning sequence, we will almost never make significant adjustments to the intelligence estimate, irrespective of the need to do so. This is borne out by recent experience at the National Training Center (NTC), with observers reporting frequent instances of good initial IPB and intelligence estimates, but failure to update as conditions change. As an example, in one instance a battalion task force received clear information on the location of massed enemy formations threatening the task force's planned attack. But the S-2 did not adjust the

intelligence estimate, and the task force continued with the original -- and now ineffective -- plan.[59]

Two brief historical examples will illustrate some of these points. The first is the 1950 Chinese offensive launched against U.S. forces in Korea. The second is the 1944 German Ardennes offensive. Since both of these examples are well known and extensively documented in other sources, I will confine my remarks to some of the intelligence factors of note in them.

In October 1950, most intelligence staffs in Korea saw Chinese intervention as a major contingency, but there was little agreement on the scope or form of the intervention, or even on the probability of its occurrence.[60] By late October, the G-2 of Eighth U.S. Army (EUSA) had extremely accurate order of battle estimates of the large Chinese buildup along the Yalu River. Yet his official reports were consistently conservative in their analysis of the probability of massive Chinese intervention. This was due to the extreme political sensitivity of the issue, and to the "paralyzing" effect of this thought on South Korean troops.[61] Such an underestimate of probability due to the inability to deal with an additional threat is an example of the distraction of fear factor. Interrogation of a number of Chinese taken prisoner in isolated engagements in late October revealed new

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[59] Center for Army Lessons Learned, observation #5156, NTC rotation 89-06. Additional examples of failure to adjust intelligence estimate/IPB found in observations #3501, 3522, 4500, 4526, 4587, and 5151.

[60] Schnabel, James F.; Policy and Direction: The First Year; (United States Army in the Korean War series) Washington, D.C.: Office of the Chief of Military History, United States Army, 1972; pp. 196-202 and 274-276.

[61] Marshall, S.L.A.; The River and the Gauntlet; Nashville: The Battery Press, 1987; p. 7.

information. They all claimed to be forced "volunteers" in the North Korean army (NKA), and they revealed their unit designations and approximate size. On the basis of this information, the EUSA G-2 estimated there were 9,000 Chinese south of the Yalu, reinforcing the NKA; he later revised this to 30-60,000.[62] Here is a good example of new data being interpreted as supporting the initial assessment. The EUSA G-2 felt that if the Chinese did intervene, it would be in the form of limited reinforcement to the NKA. Thus, he tended to put more weight on the data which confirmed this analysis, and less on that which might point to indications of an all out Chinese offensive (such as the masses of troops on the Yalu). Of course, the same estimate was being made by intelligence staffs up through the National level, an example of the organizational bias for consistency. One final interesting note. At the time the EUSA G-2 estimated 30-60,000 Chinese were south of the Yalu, he postulated three possible explanations for their mission: 1) Provide limited assistance to the NKA for defense of North Korea; 2) Conduct a show of force to stay MacArthur's hand; and 3) Provide a screen for follow on forces to cross the river.[63] This is an excellent example of an anchor shift from a base position. The base position was that the Chinese would reinforce the NKA to some degree. Thus, when forces were discovered south of the Yalu, their strength was estimated at 30-60,000 and their purpose was estimated to be some variation of reinforcement, with the greatest divergence from anchor point being

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[62] Ibid., pp. 8 and 10.
[63] Ibid., p. 13.

the possibility of introducing more forces at some time in the future. In point of fact, at the time of the G-2's estimate, three Chinese armies (over 100,000 troops) were south of the Yalu, and three more would cross within a matter of days.[64] The EUSA G-2 had simply had a cognitive bias against straying too far from the established estimate in assessing new data.

The tactical intelligence failures of the 1944 Ardennes offensive are well documented, and I will not further analyze them here, except to relate some of the failings to behavioral factors. Beginning in September 1944, Allied intelligence began noting German unit movements indicative of a major operation. Their initial assessment limited the possibilities to counterattack or spoiling attack.[65] Failure at the outset to consider the possibility of an all out German offensive is another example of the inhibiting effects of an anchor bias: recent estimates of German capabilities did not admit to such a possibility, and to postulate one now on the basis of the new information would have gone beyond the invisible anchor line. There was more and more information available in the weeks that followed, yet the Allied intelligence chiefs persisted in their original estimate, narrowing it in November to one option: German counterattack of American forces crossing the Roer, to be spearheaded by Sixth Panzer Army and assisted by Fifth Panzer Army.[66] Thus we see an initial assessment made on the basis of a small amount of consistent

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[64] Ibid.

[65] MacDonald, Charles B.; A Time For Trumpets: The Untold Story of the Battle of the Bulge; New York: Bantam Books, 1985; p. 63.

[66] Ibid., p.64.

information: armored forces are being pulled out of the line and put into a reserve, other forces including air are being moved around, Americans are preparing a push across the Roer, both sides are using the Ardennes sector as an area to rest veteran divisions and season new ones, and the terrain there was restrictive. As more and more information was received, the picture became less consistent, but insofar as possible data were either interpreted as supporting the counterattack hypothesis, or discounted. Of note, even the Allied advantage of ULTRA failed in this case, not because it wasn't providing good information -- it was -- but because it never provided specific information on the attack.[67] Once the hypothesis of German counterattack had become the accepted one, only the receipt of unambiguous, highly reliable information could change it. While ULTRA was accepted as reliable, it did not in this instance provide the specifics necessary to be considered unambiguous.

Of somewhat more interest in the case of the Ardennes offensive are the three instances of Army G-2s glimpsing the truth. Early in December the British G-2 of the First Allied Airborne Army, LTC Anthony Tasker, began to brief the Ardennes as the probable site of a German offensive. However, First Allied Airborne Army was in England, not involved in operations, and published no intelligence estimates, so little attention was paid to LTC Tasker.[68] Of note for our purposes, he had access to exactly the same information as other Allied intelligence chiefs, but perhaps his detachment from day to

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[67] Ibid., p. 78.
[68] Ibid., p. 77.

day operations and his isolation from his colleagues allowed him to see it in a different light.

The second instance involved COL Monk Dickson, the G-2 of First Army. Late on the night of 14 December at a staff meeting, after wrestling with the problem for weeks, trying to make the growing body of puzzling information fit into the counterattack theory, COL Dickson is reported to have leapt up, slapped the map, and cried, "It's the Ardennes!"[69] Subsequently, however, he thought better of his outburst and retreated from what he undoubtedly considered a rash leap of logic. The interesting point here is that, having seized upon a perfectly valid alternate explanation for the weeks of German activity, he did not pursue it. Behavioral factors influencing his decision may well have been the drive for organizational consistency, in combination with attachment to the initial perception and psychological investment in the estimate.

Finally, there was COL Oscar Koch, the G-2 of Third Army. For a variety of reasons, he had not fully accepted the prevailing theory of a German counterattack in the north. In late November and early December, he requested aerial reconnaissance of the Eifel region, and he concentrated his analysis on anomalous information. This included note of such things as the fact that the enemy had taken at least thirteen divisions out of the line, that there was a large *relative* concentration of forces opposite VIII Corps, and that it did not make sense for the enemy to pull panzer divisions out of the line if he intended to make a strong defense. Though he did not predict an all

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[69] Ibid., p 76.

out offensive, he did make a case for "a spoiling or diversionary offensive" in the region. He even put his concerns in writing on December 10, but three days later recanted and reverted to the party line of a German counterattack in the north.[70] Koch's own recollection of the incident differs somewhat on the issue of recanting; he indicates that his assessment remained more or less constant from that point on.[71] The points to be taken from this example are the value of analyzing (as opposed to discounting or skewing) discrepant data and the importance of analyzing relative capabilities. Concerning the latter, the German concentration of forces opposite VIII Corps was only apparent when one analyzed the disposition of VIII Corps, as well as the relative force ratios on the flanks. Another factor that Koch considered in making his maverick assessment was the consequence should such a course of action be carried out, no matter how improbable; he calculated that such action would constitute a serious threat to the flank of an advancing Third Army, thus the possibility merited further study.[72] Finally, as in the case of Dickson, we see the difficulty of maintaining a competing point of view, even when the evidence for doing so is sound.

IMPROVING TACTICAL INTELLIGENCE PREDICTION

Given the doctrinal requirement for intelligence prediction, the complexities of the problem, and the obvious inadequacies of IPB,

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[70] Ibid., pp. 68-69.
[71] Koch, BG Oscar W. with Robert G. Hays; G-2: Intelligence for Patton; Philadelphia: Whitmore Publishing Company, 1971; pp. 84-90.
[72] Ibid., p. 84.

what intelligence analytical methodology ought the U.S. Army to pursue? In general, it is time to move on from IPB (a legacy of the 70's) and apply some methods of behavioral science to what is essentially a behavioral problem. Before going on to make specific recommendations, let me emphasize that there are two approaches we should not take. One is to put intelligence prediction in the "too hard" box and alter our doctrine so that the G-2 becomes a mere cataloguer of data. The other is to abandon IPB altogether; it is a good process and with some significant expansion can meet the intelligence prediction needs of the Army.

Successful intelligence prediction is the result of the application of analytical methods to a body of information. Since in a given tactical situation the body of information does not change, other than to grow larger, analytical manipulation is the only means available for exploring the full range of possibilities presented by the information. The challenge is to develop an analytical method which allows for the practical and efficient manipulation of information, with the goal of minimizing the biases inherent in the single analysis approach.

Currently, IPB focuses on directly observable data to build a body of information. Such data includes battlefield boundaries, terrain, weather, composition and disposition of enemy forces, and recent enemy activities. The IPB body of information also includes some indirectly observable data in the form of enemy doctrine. The analytical part of IPB consists of trying to adapt doctrine to the

observable data, or to as much of it as fits, then capturing the result graphically in the form of situation, event, and decision templates.

I propose an expansion of this process, both in the scope of the body of information and in the range of analyses applied. First, the body of information will consist of baseline and situational data. Baseline data is that which remains relatively fixed for any given situation and includes:

- Current IPB concepts of battlefield area evaluation, terrain evaluation, and weather evaluation.
- Order of battle information, such as would be found in an updated order of battle workbook, on those units which oppose us.
- Detailed information on enemy decision making processes. For a Soviet style enemy this must include being able to do the mathematical calculations involved in assessing correlations of forces and operational/tactical norms, using either nomograms or computer software. It also includes knowledge of how and when such quantitative data is used in the decision making process.
- Enemy doctrinal information in the form of textual references, doctrinal templates, and doctrinal event templates. The latter are not now generally available in a single source or tactically efficient format, but they should be developed as an aid to analysts.
- "Type" situational and event templates. By these I mean the kind of graphics that IPB now produces during the threat integration phase, but in simplified form. They should merely be the adaptation of doctrinal templates to terrain and weather. Since their preparation requires a good deal of time, they can be prepared as part of long

term planning. In peacetime, they are part of contingency or general defense planning.

Situational data, the other part of the expanded body of information, refers to data that is relatively changeable in the tactical situation. It includes:

- Enemy locations, subordinations, LOCs, and other data generally included on the intelligence sitmap.
- Enemy activities.
- Enemy knowledge of our activities and force composition, disposition, strength.

The analytical procedures in expanded IPB are designed to minimize the negative effects of behavioral factors on prediction. Having begun compilation of the body of information described above, the procedural steps for analysis would be as follows (data collection is ongoing):

- Estimate possible enemy courses of action solely from the enemy commander's point of view. This must be done insofar as possible using enemy decision making procedures. Although we will seldom arrive at the same conclusions as the enemy commander, the result should give us a range of options very similar to those considered by the enemy.[73]

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[73] For the Soviets, much of this information is available in open sources. Unfortunately, it is scattered and often available only in Russian. A compilation of the information in English, organized for use by tactical intelligence analysts, to the detail necessary for practical application, would be a worthy project for TRADOC or some National level intelligence agency.

• Estimate enemy courses of action which would have significant negative effect on our own course(s) of action. This should be done independently of the above step and should not initially be limited to "feasible" courses of action.

• Estimate possible enemy courses of action based solely on recent enemy activity. This estimate must also be conducted independently of the two listed above. The goal is to provide one or more explanations, each of which would account for all observed enemy activity (or barring that, leave the least number of anomalous reports).

• From the list of possible enemy courses of action identified by the three estimates, eliminate for the time being those which are minor variants of another. This will result in a true range of options, as opposed to a set of variations on the same theme.

• Make an initial assessment of relative probabilities of occurrence, based on all available information. Continue to reassess all probabilities in light of new information, adjusting the relative order as necessary.

• Use the latest enemy course of action assessment and the body of information to produce decision aids and manage collection assets, in the same way we currently use IPB.

The main advantage to the above procedure is that it retains the solid structure of IPB while at the same time providing an informational and procedural base for expansion. Although I divided the data base into baseline and situational data, any number of

different categories could be used, depending on the threat. Similarly, while I listed three specific points of view from which to estimate enemy courses of action, other points of view might be appropriate under some circumstances. The key is that we are no longer tied to the limitations of IPB, and we have begun to formalize methods for lessening the effects of behavioral factors.

FURTHER IMPLICATIONS

Expanding IPB as described above needs to be a formal process, involving both TRADOC and FORSCOM. During this process, planners ought to pursue a number of indirect implications suggested by a study of behavioral factors. Some of these are:

- The need for the development of some statistical methodology for macro analysis of masses of data. This might help to negate the problems of consistency bias (high confidence in high-consistency/low-volume data, low confidence in low-consistency/high-volume data).

- The need for a method of evaluating information, beyond the old source/reliability level. For example, it might be profitable to weight information according to when it was received, relative to the tactical planning sequence.

- At TRADOC schools, the need to train analysts to accurately estimate the accuracy of their knowledge, using confidence feedback exercises.

• The need to compile, teach, and use Soviet methods for correlation of forces and norms, and how a Soviet planner uses these tools in decision making.

• The need for more emphasis on the collection of enemy biographical data, with focus on an officer's risk-taking profile.

In addition to the specific recommendations for expanding IPB, there are a number of administrative procedures suggested by the discussion on behavioral factors that could readily be tried in the field. Some of these are:

• Collection Procedures. Given the propensity for placing greater weight on data received early in the planning cycle, collection planning in the initial stages of a tactical decision cycle assumes great importance. Building a large body of information in the period just prior to hostilities, when time is relatively abundant, would give analysts a wider base upon which to base the initial estimate. This is critical, since the initial estimate might well determine all subsequent ones.

• Periodically "shuffle" data, so as to provide it to analysts in a different order than it was originally presented.

• Have different analysts join the estimative process at different times, so as to gain a wide range of "initial" perceptions.

• Require each analyst, from the newest private to the G-2, to provide an independent estimate. If possible, when considering them, do not identify whose estimates they are.

• Identify an analyst as the "devil's advocate". His job would be to constantly seek alternate explanations for incoming data, different from the "party line." For this to work, it must have senior level support to prevent its becoming a mere formality in the development of the estimate.

• Periodically assemble the body of data that falls into the categories of true-irrelevant, false-irrelevant, and false-relevant, and study with the goal of establishing a single causal explanation for it.

• Periodically list all events in the data base which could be random occurrences, caused only by chance or fog of war.

• Assume the enemy is employing an active deception, and try to identify that data which supports the deception.

Last but not least, let us discuss the factor of time, which frequently is the overriding concern and governing factor in tactical planning. Particularly in matters of the intelligence estimate, which must be completed early in the planning sequence, any suggestion for expanding current procedures must be looked at closely to judge if the benefits gained are worth the extra time required. I believe the answer is yes, for if the initial intelligence estimate is fatally flawed, the rest of the planning sequence is largely futile. Additionally, in the same way that very well trained staffs can condense the formal planning sequence to fit even severe limitations of time, a well trained intelligence section should be able to internalize the concepts for overcoming analytical biases and perform multiple analyses quickly and as a matter of course. The

resulting consistency in analytical depth will have the added advantage of increasing credibility in the intelligence estimate, an important consideration since even the best intelligence estimate is of no use if commanders and operators have no faith in its validity.

CONCLUSION

This paper has examined U.S. Army doctrine and found that it clearly requires tactical intelligence to be predictive in nature. IPB is the current vehicle for such prediction, but the limited scope of its data base and its single analytical approach make it inadequate for the task. This is because, although such factors as terrain, enemy doctrine, and observed activities are the foundation for prediction, human behavior and perceptual mechanisms exert an extraordinary influence on the process. Historically, failures to recognize and break away from this influence have caused serious misjudgments on the part of intelligence officers and resulted in defeat or disadvantage for American forces. On the other hand, when intelligence officers were able to rise above the prevailing analytical biases, they achieved more accurate predictions of enemy courses of action.

Recognizing the nature and power of behavioral biases and understanding how they affect intelligence analysis are the keys to improving tactical intelligence prediction on the modern battlefield. Such recognition and understanding can and must be institutionalized, and the way to do so is to amplify our current predictive process, IPB. Specifically, the IPB data base must be expanded and organized so as to allow extraction and grouping of

information that will facilitate analysis from multiple points of view. Then the single analytical procedure currently used in IPB must be replaced by a system of multiple analyses, designed to identify the full range of options available to the enemy. Finally, in addition to expanding the current IPB process, there are a number of procedural measures that can be taken to help overcome behavioral hindrances to tactical intelligence prediction. By understanding the full range of factors which influence tactical intelligence prediction, and by implementing the recommendations outlined in this paper, we can provide the tactical commander with the intelligence he needs to make decisions on the modern battlefield.

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